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Docket No.: 61537B
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Ravi Ramanathan et al.

Application No.: 10/673,615 Confirmation No.: 2556

Filed: September 29, 2003 Art Unit: 1772

For: FUEL TANKS Examiner: C.P. Bruenjes

APPEAL BRIEF

MS Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

As required under § 41.37(a), and pursuant to a two-month Extension of Time under 37 CFR 1.136(a), this brief is filed within four months of the Notice of Appeal filed in this case on March 6, 2006, and is in furtherance of said Notice of Appeal.

The fees required under § 41.20(b)(2) are dealt with in the accompanying TRANSMITTAL OF APPEAL BRIEF.

This brief contains items under the following headings as required by 37 C.F.R. § 41.37 and M.P.E.P. § 1206:

I.	Real Party In Interest
II	Related Appeals and Interferences
III.	Status of Claims
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V.	Summary of Claimed Subject Matter
VI.	Grounds of Rejection to be Reviewed on Appeal
VII.	Argument
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Appendix A Claims

I. REAL PARTY IN INTEREST

The real party in interest for this appeal is:

Dow Global Technologies Inc.

II. RELATED APPEALS, INTERFERENCES, AND JUDICIAL PROCEEDINGS

There are no other appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS

A. Total Number of Claims in Application

There are 25 claims pending in application.

B. Current Status of Claims

1. Claims canceled: 16-20, 22, 31-38

2. Claims withdrawn from consideration but not canceled: none

3. Claims pending: 1 to 15, 21, 23 to 30 and 39

4. Claims allowed: none

5. Claims rejected: 1 to 15, 21, 23 to 30 and 39

C. Claims On Appeal

The claims on appeal are claims 1 to 15, 21, 23 to 30 and 39

IV. STATUS OF AMENDMENTS

Applicant did not file an Amendment After Final Rejection.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The invention claimed is a fuel tank comprising two or more sections having an untreated low energy surface bonded together with an adhesive, wherein the adhesive bonds to low energy surface materials, the cured adhesive has a lap shear strength of about 400 psi or greater, and the adhesive does not require surface pretreatment of the low energy surface materials in order to bond to the low energy surface, Claim 1. Preferably, the adhesive supports a load of 1334 Newtons, Claim 5. Preferably, the adhesive has a fuel vapor permeation rate of not more than 46 g-mm/m^2/day, Claim 6. In a preferred embodiment, the adhesive comprises an amine/organoborane complex, Claim 7. The preferred amine/organoborane complexes in the adhesive contain as the organoborane a trialkyl borane or alkyl cycloalkyl borane and the amine is selected from the group consisting of (1) amines having an amidine structural component; (2) aliphatic heterocycles having at least one nitrogen in the heterocyclic ring, wherein the heterocyclic compound may also contain one or more nitrogen atoms, oxygen atoms, sulfur atoms, or double bonds in the heterocycle; (3) primary amines which in addition have one or more hydrogen bond accepting groups wherein there are at least two carbon atoms, preferably at least three carbon atoms, between the primary amine and the hydrogen bond accepting group, such that due to inter- or intramolecular interactions within the complex the strength of the B-N bond is increased; and (4) conjugated imines, Claim 8.

In another embodiment, the invention is a fuel tank assembly comprising a fuel tank and fuel tank component(s) selected from the group consisting of a fill spud, vent valve, access cover, fuel line, fuel pump, fuel cut-off valve, fuel level gauge, clip, cam lock, fuel sender, roll-over valve, and heat shield, wherein such parts are joined to the fuel tank by means of an adhesive wherein the fuel tank, fuel tank components or both have an untreated low energy surface and the adhesive bonds untreated low energy surfaces, Claim 21. Preferably, the fuel tank assembly further comprises a primary seal applied at the joint between the fuel tank and the fuel tank component(s) and a redundant seal is applied around the primary seal, Claim 26. Preferably, the fuel tank and fuel tank components are coated with a vapor phase plasma coating, Claim 27. In another embodiment, the fuel tank walls comprises a multilayer structure having a barrier layer sandwiched between layers of untreated low energy surface material, Claims 29 and 30. Preferably, the adhesive has a lap shear strength of about 400 psi and bonds to low energy surface materials without surface pretreatment of the low energy surface materials, Claim 39.

VI. GROUNDS OF OBJECTION TO BE REVIEWED ON APPEAL

Claims 1-15, 21, 23-26, 29 and 39 are rejected under 35 USC§103(a) as being unpatentable over Wood, U.S. Patent 5,928, 745 (hereinafter Wood) and in view of Zharov, U.S. Patent 5,539,073 (hereinafter Zharov).

Claims 1-15, 21, 23-26, 29 and 39 are rejected under 35 USC§103(a) as being unpatentable over Straetz, U.S. Patent 6,545,114 (hereinafter Straetz) in view of Zharov, U.S. Patent 5,539,070 (hereinafter Zharov).

Claims 27-28 are rejected under 35 USC§103(a) as being unpatentable over Wood or Straetz in view of Zharov as applied to Claim 21 above and in further view of Yang et al., U.S. Patent 6,110,554 (hereinafter Yang).

Claim 30 is rejected under 35 USC§ 103(a) as being unpatentable over Wood or Straetz in view of Zharov as shown above and in further view of Chan, U.S. Patent 2002/0172,788A1 (hereinafter Chan).

The claims do not stand or fall together. The claims are grouped together for argumentation sake as follows. The reasons for this grouping will be apparent by the arguments presented hereinafter. Group 1, Claims 1 to 4 and 14 to 15; Group 2, Claim 5; Group 3, Claim 6; Group 4, Claims 7 and 11 to 13; Group 5, Claims 8 to 10; Group 6, Claims 21, and 23 to 25; Group 7, Claim 26; Group 8, Claims 27 and 28; Group 9, Claims 29 and 30; and Group 10, Claim 39. The Appellants request that the Honorable Board of Patent Appeals and Interferences consider the patentability of each group separately for the reasons discussed in the Argumentation section of this Brief.

VII. ARGUMENT

Wood relates to an improved fuel reservoir or tank containing a barrier to the passage of fuel vapor by permeation or diffusion from the interior of the container into the environment. The solution disclosed is the addition of a particular cyclodextran to the plastic used to manufacture the fuel tanks. See column 3, lines 8 to 15. Wood discloses at column 3, lines 52-64:

> "Further the fuel tank can be prepared by joining half tank sections at a joining edge and sealing the tank using thermal welding, hot melt adhesives, thermosetting (e.g., epoxy or urethane) adhesives, flange, clamps, or other known sealing technology. ... The tanks can be manufactured with a port for a fuel pump or a fuel line, an instrument port opening, a filler tube ports (sic) and mounting flanges or other mounting means."

It is further disclosed at column 7, lines 57-63:

> "Such tanks can be made by forming or casting a single unit or can be made by joining two or more sections into a finished unit. Such joinery can be accomplished using thermal or heat welding, adhesives (both thermoplastic and thermosetting), mechanical clamps or other joinery, etc. Further, the tanks can be formed having ports for sensor installation and for fuel inlet tubes."

It is further disclosed that the resin used to make the fuel tank can be a polyolefin, see column 4, lines 59-60. Woods discloses that epoxy or polyurethane adhesives could be used for joining the parts; see column 3 lines 51-55.

Straetz discloses providing a plastic fuel tank which consists of two halves which are initially produced in one piece by a blow molding method. The two halves are produced in one workshop and in one mold. The plastic casing is subsequently severed at points provided for this purpose; see column 1, lines 39-45. The halves are subsequently reconnected. See column 2, lines 31-33. It is disclosed at column 2, lines 44-45 that the connection may take place by welding or adhesive bonding. At column 2, lines 6-15, it is disclosed that the polyethylene may be used as the resin for making the fuel tanks. Straetz further discloses at column 3, lines 32-47:

> "that fittings may be welded to the tank halves and that after the fittings have been introduced, the halves are laid one onto the other and then sealed to form a leak type connection, for example, by welding."

Zharov discloses a polymerized acrylic composition comprising an effective amount of an organoborane amine complex. Zharov further discloses that the adhesives are particularly useful in bonding low surface energy substrates, such as polyolefins. See column 3, line 66 to Column 4, line 6. The amine/organoborane complexes comprise a primary or secondary amine having bonded to the amine nitrogen a hydroxyl ethyl group or a C_{2-6} alkyl amine. In the embodiment where the amine is secondary, the other ligand bonded to the amine is a C_{1-10} alkyl group. See column 4, lines 15 to 35.

Chan discloses deposition of a coating comprising silicon dioxide or silicon oxide on polycarbonate using a plasma torch. See column 1 line 56 to column 2, line 7.

Yang discloses manufacturing a multilayer structure comprising outer layers of polyolefin and a barrier layer of a powder deposited by a flame spray coating process. The structures can be used in fuel containers. See paragraphs 0021 to 0023.

The question presented is whether a case of *prima facie* is made out by substituting the teachings of Zharov into either Wood or Straetz. More particularly, the question is whether the Final Rejection has established sufficient motivation to combine the teachings of the references. The Final Rejection at page 5, second paragraph states:

> "Wood et al. fail to teach that the adhesive has a lap shear strength of about 400 psi or greater and which does not require surface pretreatment of the low surface energy materials or that the adhesive comprises an amine-organoborane complex."

The Final Rejection also states on page 10:

> "Straetz fails to teach that the adhesive has a lap shear strength of 400 psi or greater and which does not require surface pretreatment of the low surface energy materials or that the adhesive comprises an amine-organoborane complex."

These statements are correct. The Final Rejection continues on page 6 by saying:

> "One of ordinary skill in the art would have recognized that amines-organoborane complex containing adhesives are substituted for other adhesives when the adhesive is used to bond low surface energy substrates such as polyethylene, because unlike other known adhesives the adhesive containing amine-organoborane complex can be bonded effectively to low surface energy materials without the need for costly substrate surface preparation techniques, ..."

The Final Rejection fails to establish that one skilled in the art would expect that such adhesives as disclosed in Zharov would be successful in reliably bonding the parts of a fuel tank together. First, the Final Rejection does not establish the necessary properties for adhesives used for bonding fuel tanks together. There is no demonstration that the adhesives as described in Zharov have equivalent properties for such application to the adhesives described in Wood. Nor is there any evidence presented that the adhesives as described in Zharov could withstand, or perform acceptably, in light of the environment and stresses applied to the adhesives in use for bonding a fuel tank. Absent a teaching or suggestion in the art that the adhesives described in Zharov have acceptable properties for this particular use, no expectation

of success is established and these two Rejections must be withdrawn. Furthermore, Zharov does not disclose adhesives containing organoborane/amine complexes wherein the amine is selected from the group consisting of (1) amines having an amidine structural component; (2) aliphatic heterocycles having at least one nitrogen in the heterocyclic ring wherein the heterocyclic compound may also contain one or more nitrogen atoms, oxygen atoms, sulfur atoms, or double bonds in the heterocycle; (3) primary amines which in addition have one or more hydrogen bond accepting groups wherein there are at least two carbon atoms, preferably at least three carbon atoms, between the primary amine and the hydrogen bond accepting group, such that due to inter- or intramolecular interactions within the complex the strength of the B-N bond is increased; and (4) conjugated imines as required in Claim 8. Nor does Zharov disclose complexes wherein the amine corresponds to the structures described in Claims 9 and 10 or the preferred class of amines claimed in Claim 11.

Straetz provides no teaching or suggestion as to the type of adhesive which may be used to bond fuel tanks together. Wood does not teach bonding the fuel tank parts together or bonding parts onto a fuel tank wherein the surfaces to be bonded together are low energy surfaces, that the low energy surfaces can be untreated and that the adhesive utilized must have a lap shear strength of about 400 psi or greater. Further, Wood does not disclose that the adhesive can support a load of 1.340 Newtons (Claim 5) or the adhesive has a fuel vapor permeation rate of not more than 46 grams per millimeter meter^2/day (Claim 6). Nor does Wood teach that the adhesive can comprise an amine organoborane complex as required according to Claim 7. Therefore, the primary reference Wood or Straetz contains insufficient teaching to establish a case of *prima facie* obviousness.

Therefore, the Official Action cites as a secondary reference Zharov. In order to properly combine the teachings of two or more references, the Final Rejection must clearly indicate where in the prior art there is (1) a motivation for the combination, and (2) an expectation that the substitution of teachings of the secondary reference into the primary reference would result in a structure which would perform as expected, that is, that there is an expectation that the proposed modification would be successful. The Final Rejection does not provide a description in the prior art which provides such motivation or which provides an indication that if the modification were made the resulting structure would be successful in performing as expected.

Zharov discloses amine organoborane complex initiated adhesives and that such adhesives bond to low energy surfaces. The Examiner has been asked to point out where in the cited references there is any suggestion that the adhesives as disclosed in Zharov could be used to bond fuel tanks together. The Final Rejection did not provide such teaching and absent such teaching, this combination is improper and can not be used to establish a case of *prima facie* obviousness. The

Appellants' specification is the only place where the disclosure of using adhesives as disclosed in Zharov for assembling a fuel tank or assembling parts to a fuel tank is found. The teaching of the specification can not be used as the basis for motivation to combine references.

The analysis of motivation to modify the teachings of a primary reference can not be performed in a vacuum and must be performed in view of the state of the prior art at the time the invention was filed. First, it is well known that in commercial practice today, all fuel tanks are bonded together using vibration welding or hot plate welding and not adhesives. See the specification at page 1, line 26 to page 2, line 2. See, the Declaration of Toni Ristoski, in the October 7, 2005 Response, which describes the state of the art. Furthermore, it is known that the standard adhesives which are disclosed in Wood of epoxies and polyurethanes do not bond to low energy surfaces. It is disclosed in several references that a variety of treatments can be performed on low energy surfaces to modify the energy or wetting ability of that surface to make it a higher energy surface to allow such surface to accept the adhesives such as epoxies and polyurethanes. See, *Adhesives Age*, October 1996, pages 38-44, in Response B. See also the following U.S. patents. Schaetzle, U.S. Patent 5,976,291 at column 1, lines 21-27 and column 2, lines 58-67; Gutowski et al., U.S. Patent 5,879,757 at column 1, lines 5-65 and column 3, line 66 to column 4; Matsuda et al., U.S. Patent 5,576,558 at column 1, lines 14-42 and column 4, lines 21-23; Blow et al., U.S. Patent 5,307,428 at column 1, line 20 to column 2, line 40 and Simpson et al., U.S. Patent 5,132,172 at column 1, line 18 to column 2, line 39; Birnbrich et al., U.S. Patent 6,107,406 at column 1, line 6 to column 2, line 43; Bilkadi, U.S. Patent 5,639,546 at column 1, lines 20-62 and column 3, lines 47-53; and Kunz, U.S. Patent 5,387,449 at column 5, line 45 to column 6, line 30.

Wood discloses the types of adhesives that may be useful for bonding fuel tanks together and those include epoxies, polyurethanes and hot melt adhesives. The reason epoxies and polyurethanes are used is because they provide properties which are needed for the environment of use. The adhesives disclosed in Zharov are not epoxy adhesives, polyurethane adhesives or hot melt adhesives. Therefore, in order for one skilled in the art to substitute adhesives as described in Zharov for those described as useful in Wood, one skilled in the art must have a belief that they are equivalent. No evidence has been presented in the Final Rejection or in any of the cited references that the adhesives as disclosed in Zharov are equivalent to the adhesives disclosed in Wood as being useful for bonding fuel tanks together. Absent this demonstration of equivalence from the prior art, the combination of the references is not supported and there is no motivation to make this substitution.

Neither Wood nor Zharov disclose the adhesive properties necessary for the application. Neither reference discloses that the adhesive demonstrate a lap shear strength of 400 psi or greater as required in Claim 1, nor does it disclose the utilization of an adhesive that can handle loads of 1334

Newtons or greater as required in Claim 5, and it does not disclose the maximum permeation rate as required in Claim 6. There is no disclosure in Zharov as to whether the adhesives disclosed therein would meet these property requirements. Absent the teaching in the prior art or in the references that adhesives to be used for such use require such properties and a teaching in Zharov that the adhesive disclosed in Zharov has such properties, there is no motivation to substitute the adhesives as disclosed in Zharov into Wood. This also demonstrates no expectation of success has been established. Because there is no discussion in either Wood, Zharov or a third reference which identifies the necessary properties required of the adhesives and that the adhesives of Zharov meets those properties, there can be no expectation of success. Absent this expectation of success as based on evidence, one skilled in the art would not make the substitution and no case of *prima facie* obviousness is made out.

Further, the paper from *Adhesives Age*, makes it very clear that there are significant difficulties in utilizing adhesives to bond to low surface energy materials and that the only way to secure such bonding is by modification of the surface and to change the surface to a higher energy surface. Thus, the adhesives disclosed in Wood do not bond to low energy surfaces, but bond to surfaces modified to change them to higher energy surfaces. This would motivate one skilled in the art away from even trying the suggested substitution.

Furthermore, the Official Action fails to recognize that the standard method used commercially to bond fuel tanks together is thermal welding and vibration welding. The Examiner has been asked the question, why would someone utilize an adhesive over what is the present state of the art commercially? It is submitted that this question is not answered and absent properly answering this question, one skilled in the art has no motivation to make the suggested substitution and no case of *prima facie* obviousness is made out.

Turning now to certain statements made in the Official Action which need to be addressed separately. On page 4, the Official Action dated July 7, 2005 states:

> "Therefore, because Wood et al. teaches adhesive bonding of the fuel tanks made of high density polyethylene. Wood et al. inherently teaches that the adhesive bonds to low surface material."

This is incorrect. The state of the art is that low energy surface materials are treated by a variety of means to change the nature of the surface from a low energy surface to a high energy surface. See the references cited hereinbefore.

At the top of page 5 of the Official Action dated July 7, 2005, it is stated that: "Parts are obviously bonded to walls of fuel tanks using an adhesive." Appellants can find no place in the Wood

reference where it teaches that parts are bonded to the fuel tank. Appellants respectfully requested that the Examiner answer "where in the Wood reference it is disclosed that parts is bonded via adhesive to the fuel tank wall?" The Final Rejection does not answer this question. Furthermore, Straetz cited by the Examiner indicates that fittings are welded to tank halves. See column 3, lines 33-47. Thus, based on the Straetz reference provided in the Official Action, this conclusion is contrary to the teaching of the Straetz reference.

The Official Action dated July 7, 2005 at the bottom of page 5 carrying over to page 6 states:

> "An adhesive with the same composition and make will have the same characteristics including having a lap shear strength of about 400 psi or greater, supporting a load of 1334 Newtons and having a fuel vapor permeation rate of not more than 46 grams/mm/m^2/day. One of ordinary skill in the art would have recognized that amine-organoborane complex containing adhesives are substituted for other adhesives when the adhesive is used to bond low energy surface substrates, such as polyethylene because unlike other known adhesives, the adhesive containing organoborane complex can be bonded effectively to low surface energy materials without the need for costly substrate preparation techniques, as taught by Zharov et al., especially in column 1, lines 18-60 and column 4, lines 1-6."

First, the flawed logic in this argument is that there is no teaching in Zharov, Wood or any other reference of the recited lap shear strengths, load bearing strengths and fuel vapor permeation rate as a requirement for the adhesive. In order for a proper case of *prima facie* obviousness to have been made out, the prior art must identify the critical properties and identify that an adhesive has the critical properties for the use of the adhesive in the described structure. As discussed before, the prior art does not provide such a teaching. Whether or not adhesives within the scope of the teaching of Zharov have such properties is irrelevant, because there was no identification of such properties needed for this use and there was no identification that the adhesives as described in Zharov have such properties. Because the need for such properties and whether or not the Zharov adhesives have such properties are not identified, there is no motivation to substitute Zharov for the adhesives disclosed in Wood and absent such motivation, there is no case of *prima facie* obviousness made out.

For these reasons, Appellants assert that the rejection of Claims 1-15 and 29 and 39 over the teachings of Wood and Zharov is inappropriate and should be reversed because no case of *prima facie* obviousness is established.

Relative to the rejection of Claims 1-15, 23-26, 29 and 39 over Straetz in view of Zharov, the following arguments are relevant. Straetz does not teach bonding parts of the fuel tank together or

bonding parts to a fuel tank wherein the surfaces bonded are untreated low energy surfaces or that the adhesive is a low energy surface adhesive. Further, Straetz does not disclose that the cured adhesive provide a lap shear strength at 400 psi or greater, the capability of handling a load of 1334 Newtons (as claimed in Claim 5), a fuel vapor permeation rate as required in Claim 6, or that the adhesive utilized can be an organoborane amine complex initiated adhesive as required by Claim 7. Thus, Straetz alone does not present the case of *prima facie* obviousness.

In order to address the deficiencies and teaching of Straetz, the Official Action cites Zharov for the same reasons it was cited in the previous rejection. Appellants assert that no motivation to combine the teaching is presented based on the lack of citations of teachings in either of the references or a third reference, which would clearly suggests this combination and teach that there is an expectation that the combination would be successful. Appellants further argue that the state of the art would motivate one skilled in the art away from such a combination. First, the Wood reference discloses bonding fuel tanks together and that adhesives named are hot melt adhesives and epoxy or polyurethane adhesives. Secondly, it is well known to those of skill in the art in assembling fuel tanks that fuel tanks are bonded together commercially using hot melt or vibration welding. There is no reference provided in the Official Action which would suggest the use of adhesives comprising organoborane amine complexes or that they can be used for such an application. In order for such an adhesive to be useful in the application, the adhesive must have adequate strength, fuel vapor barrier properties and properties to allow it to hold up under the conditions of use including exposure to hydrocarbons and sufficient strength to hold parts together under high load. There is no teaching or suggestion disclosed in Zharov that the adhesives have such properties. Furthermore, there is no teaching or suggestion in Straetz of the necessary properties needed in the adhesive for bonding fuel tank parts together or parts on a fuel tank. The Official Action dated July 7, 2005 states that:

> "The material disclosed for use in Straetz is a low energy surface material and Zharov discloses bonding low energy surfaces, therefore is motivation to use the Zharov adhesive in the application."

This argument ignores that there is no reference which teaches the adhesive properties necessary for such use nor is there is any reference which teaches or suggests that the Zharov adhesives have sufficient properties for such use. In order to have a reasonable expectation of success, there must be a reference which suggests that the adhesive selected for use has the appropriate properties for use in bonding fuel tanks together. There is no evidence that such disclosure is available and therefore is not motivation to make this substitution as there is no expectation of success.

Appellants assert that the skilled artisan would look to the art to determine what adhesives have been used in this application. Appellants pointed out earlier that Wood discloses the use of epoxy or polyurethane adhesives. The prior art cited by Appellants show when low energy surface materials are used, the surfaces are modified by treatment so as to adjust the surface energy to allow for bonding using the polyurethane or epoxy adhesives. Therefore, this would motivate one skilled in the art away from substitution of the Zharov adhesives into the teachings of Straetz. For this reason, no case of prima facie obviousness is made out and Appellants respectfully request this rejection be withdrawn.

Relative to the rejection of Claims 21 and 23-26, there is no discussion of bonding parts to fuel tanks utilizing an adhesive or the use of redundant seals as in Claim 26. The only discussion of bonding parts to a fuel tank is contained in the Straetz reference which clearly indicates that such parts are bonded via thermal welding or vibration welding.

Relative to the rejections of Claims 27, 28 and 30 over Wood or/and Straetz in view of Yang, U.S. Patent 6,110,544 and/or Chan, U.S. Publication 2002/0172788A1. Appellants hereby assert that the discussions hereinbefore relative to Straetz and/or Wood are applicable and this rejection should be withdrawn for those reasons. Neither Yang nor Chan cure the deficiencies of either primary reference disclosed above.

Relative to the rejection of Claims 28 and 29 in further view of Yang there is no teaching or suggestion that the coatings disclosed in Yang impact the properties of fuel tank structures. There is no teaching or suggestion that such coatings are useful in fuel tank structures.

The Appellants wish to address several points made by the Final Rejection. The Final Rejection states on page 4:

> "Therefore, because Wood et al. teach adhesive bonding of the fuel tanks made of high density polyethylene, Wood et al inherently teach that the adhesive bonds low energy surface materials."

This statement is incorrect. As cited in the Response filed October 7, 2005, the state of the art is that low energy surfaces must be modified by surface treatment or priming in order for many adhesives to bond to such surfaces. The treatments provided change the surface from a low energy surface to a higher energy surface capable of being bonded by the adhesives known for these uses. See, in particular, the full paragraph found on page 13 of the October 7, 2005 Response.

The Final Rejection at page 5 states:

> "Wood et al. teach a filler tube and fuel line, . . ., and obviously bonded thereto by an adhesive because it must be bonded to the tank wall opening in order to function as a filler tube or a fuel line for the fuel tank and adhesive bonding is taught by Wood et al. as a method of bonding parts of the fuel tank together."

Appellants assert that this is a misreading of the teaching of Wood. Wood does not specifically teach that parts are adhesively bonded to a fuel tank. Wood and Straetz teach that halves of a fuel tank may be bonded together. Nowhere in either reference is it disclosed to bond parts to a fuel tank. In fact, Straetz specifically teaches that parts are welded to a plastic fuel tank. See column 3, lines 30-46 and more particularly 32-36. There is no teaching that an adhesive that is useful to bond the halves of a fuel tank together may be used to bond the parts to a fuel tank. The requirements and stresses placed on such parts are different than those placed on adhesives used to bond fuel tank parts together. Therefore, one skilled in the art would not necessarily assume that the same means of attaching halves of a fuel tank together would be used to attach parts to a fuel tank.

The Final Rejection on page 6 states:

> "Therefore, it would have been obvious to one of ordinary skill in the art at the time the Appellant's invention was made to use an adhesive comprising an amine-organoborane complex, which will have the same properties as the claimed adhesive since the adhesive is the same composition, taught by Zharov et al as the adhesive joining sections of a fuel tank together to form the tank of Wood et al because the adhesive comprising an amine-organoborane complex is useful for bonding low surface energy substrates without costly surface preparation including . . . ."

It appears that the Final Rejection is saying that because adhesives disclosed in Zharov have similar properties to the adhesives claimed as useful in Appellants' invention, it is therefore obvious to combine the teachings of Zharov with the teachings of Wood to achieve Appellants' claimed invention. Appellants respectfully suggest that it is improper to use the teachings of the claims being examined as the logical link for combining two prior art references. The motivation to combine the teachings must not come from the examined claims but must come from either the two references cited or a third reference. As no third reference is provided which suggests an appropriate link, the combination of Zharov, Wood or Straetz is improper.

With regards especially to Claims 21-23 and 26, the Final Rejection concludes on page 7, second paragraph:

> "One of ordinary skill in the art would have recognized that adhesives are also used to join fuel components to the fuel tank if adhesives

> are used to join sections of the fuel tank to form the tank. Also, it would have been obvious to one of ordinary skill in the art to add a second seal of adhesive to a primary seal when joining components to the fuel tank in order to increase sealability."

The first issue is addressed hereinbefore. As to the second issue, none of the references cited provide any teaching or suggestion that there is a need for a second seal or that a second seal would be useful. To conclude it would be obvious to use such a second seal without evidence is improper. A reference or evidence suggesting this feature which is properly combinable with one of the primary references is necessary to establish a case of *prima facie* obviousness. As no such evidence or reference is cited, it is improper to draw the conclusions drawn and the rejection of Claim 26 for this reason must be withdrawn.

The Final Rejection on page 8 concludes:

> "Joining components by a different method other than adhesive serves the same function and therefore any method of permanent sealing of the component to the fuel tank such as welding performs the equivalent function of permanently sealing the two articles together and determining which method to use is within the level of ordinary skill in the art, absent the showing of unexpected result."

The Final Rejection provides no evidence for this conclusion. Furthermore, this clearly ignores the conclusions drawn in the Declaration of Toni Ristoski filed with the October 7, 2005 Response. Toni Ristoski states that after studying this market and the technology used in this market, that at a commercial level only welding means are used to seal parts of plastic fuel tanks together. This clearly indicates that the various means of permanently sealing a fuel tank or a component to a fuel tank are not equivalent because if they were equivalent, all of these techniques would be used commercially. The burden of establishing all of the facts necessary for a case of *prima facie* obviousness lies with the U.S. Patent Office. Drawing a conclusion without evidence to support the conclusion is insufficient basis for a case of *prima facie* obviousness.

On page 9, the Final Rejection states:

> "Straetz teaches that the components are attached to the tank by adhesion because he teaches that the connections when forming fuel tank are either welded or adhesively bonded."

Appellants respectfully request that the Examiner clearly point out where in Straetz this is disclosed. Appellants have previously pointed out where Straetz teaches that components are attached by welding and that Straetz does not teach attaching components by use of an adhesive. The Final Rejection on page 10 further states:

> "One of ordinary skill in the art would have recognized that an amine-organoborane complex containing adhesives are substituted for other adhesives when the adhesive is used to bond low surface energy substrates such as polyethylene, because unlike any other known adhesives the adhesive containing amine-organoborane complex can be bonded effectively to the low surface energy material without the need for costly substrate surface preparation techniques, as taught by Zharov et al . . ."

This statement ignores the relative properties of adhesives disclosed in Wood for use in bonding halves of a fuel tank together and does not address the issue of whether the adhesives as disclosed in Zharov have all of the necessary properties to work as an adhesive for bonding halves of a fuel tank together. Because no evidence is presented relative to this issue, it is improper to combine the teachings of Zharov with Straetz. More particularly, it is improper to substitute the adhesives of Zharov into the Straetz process to bond parts of a fuel tank together.

On page 11, second paragraph states:

> "Therefore, it would have been obvious to one of ordinary skill in the art at the time Appellants' invention was made to use an adhesive comprising an amine-organoborane complex, which will have the same properties as the claimed adhesive since the adhesive is the same composition, taught by Zharov et al as the adhesive joining sections of the fuel tank together to form the tank of Straetz . . . ."

This statement asserts that the adhesives claimed in Claims 8-13 are disclosed in Zharov. The amine-organoborane complexes claimed as useful in Claims 8-13 are not disclosed in Zharov.

The Final Rejection on page 11 carrying over to page 12 says:

> "Straetz fails to explicitly teach a means for attaching components to a fuel tank. However, Straetz teaches joining tank sections to form a tank by means of adhesive bonding (col. 2, 11.40-44). One of ordinary skill in the art would have recognized that adhesives are also used to join fuel components to the fuel tank if adhesives are used to join sections of the fuel tank to form the tank."

This ignores the fact that joining halves of a fuel tank together is different than attaching parts to a fuel tank. Different stresses are applied to the surfaces and the environment may be different. No evidence is provided in the Final Rejection that adhesives useful for bonding fuel tank halves together may be used to bond parts to a fuel tank.

Commenting on the Declaration of inventor Ristoski, the Final Rejection on page 16 states:

> "It include(s) statements which amount to an affirmation that the affiant has never seen the claimed subject matter before. This is not relevant to the issue of nonobviousness of the claimed subject matter and provides no objective evidence thereof. See MPEP§716. Specifically, Wood et al. and Straetz each teach that the sections of a fuel tank are bonded by adhesive bonding, this teaching is available to one having ordinary skill in the art regardless of whether it is commercially used in the industry."

The statement in the Declaration is a description of what is used commercially. This is relevant to the issue of whether the teachings of Wood or Straetz relative to bonding halves of a fuel tank together with an adhesive are enabled. The teachings of Wood and Straetz indicate that there are a variety of techniques which may be or can be used to affix the fuel tank halves together. The teachings do not disclose specific adhesive compositions which may be used to bond halves of a fuel tank together, how to do it or the properties of a suitable adhesive for achieving the objective. The fact that adhesives are not used in the commercial arena is an indication that thermal welding is viewed in the marketplace as a superior means of bonding fuel tanks together and sealing them as compared to adhesives. It also is evident that the teachings of Wood and Straetz may not provide sufficient enablement for one skilled in the art to actually achieve the objective to bonding fuel tanks together using an adhesive such that the fuel tanks are actually useful for the intended use. Thus, an additional argument as to why no case of *prima facie* obviousness is made out is that Woods and Straetz do not provide an enabling teaching as to appropriate adhesives and means of utilizing adhesives to bond fuel tank parts together.

> The remarks in the Final Rejection states on page 17:
>
> "Because Zharov teaches an adhesive used specifically for bonding low energy surfaces such as polyethylene one of ordinary skill in the art would have looked to Zharov to find an adhesive to use in Wood."

This ignores the fact that neither Wood, Straetz nor Zharov have defined the suitable adhesive properties which may be utilized to bond halves of fuel tanks together. Absent evidence which discloses the properties necessary for an adhesive to bond these parts together, one skilled in the art would be unable to tell whether the adhesives as described in Zharov would be suitable for such use. Absent such evidence, no expectation of success can be established and therefore there is no motivation to combine the teachings of the references.

Page 18 states:

> "Therefore, it would have been obvious to one having ordinary skill in the art that the adhesive of Zharov would meet the properties required of Wood such as shear strength since Zharov teaches that the adhesive forms strong bonds with low energy surfaces."

This is the basis for arguing that there is motivation to combine the teachings of Zharov with Wood or Straetz. Appellants assert that the Final Rejection has not established that shear strength alone is a sufficient property for determining whether an adhesive has adequate properties for use in bonding fuel tanks together. It is incumbent on the Final Rejection to clearly state what properties are required of an adhesive useful for bonding fuel tanks together and to demonstrate that the adhesives as disclosed in Zharov have such properties. As Straetz and Wood are silent as to the properties needed in an adhesive to bond a fuel tank or parts to a fuel tank, the skilled artisan is unable to determine which of a myriad of adhesives would be useful in such an application. Absent such evidence, the Final Rejection cannot establish that there is expectation of success as required to establish a case of *prima facie* obviousness.

The Final Rejection on page 19 states:

> "Zharov teaches the same adhesive composition as the claimed invention and the same composition must have the same properties. Mere recognition latent properties of a known article do not render that article unobvious."

First, as described before, Zharov does not teach the same adhesive composition as claimed in Claims 8-13. There is no recitation in the cited art as to what are suitable properties for bonding fuel tank parts together. Whether or not the adhesives in the claims have equivalent properties to those disclosed in Zharov is not the relevant question. The relevant question is would one skilled in the art understand from the teachings in the art as to the necessary properties for bonding fuel tank parts together or bonding components to fuel tanks? As there is no teaching or suggestion in the art what those properties are, one skilled in the art can not determine whether adhesives disclosed in Zharov or adhesives claimed in Claims 8-13 would have suitable properties for such use. The fact that those properties are not specifically described in Zharov again is irrelevant because the skilled artisan in view of the teachings of Straetz is not enabled to determine what is a suitable adhesive without a clear recitation of what are acceptable properties for such use.

Again on page 19, the Final Rejection states:

> "Zharov specifically teaches that the adhesive of Zharov is substituted for traditional adhesives that require treatment because it eliminates that costly step."

Zharov does not teach that adhesives of Zharov are substituted for traditional adhesives in all applications. There is no teaching in Zharov that its adhesives can be used in this kind of application.

Appellants assert that no case of *prima facie* obviousness is made out and request reversal of the Final Rejection and allowance of the pending claims.

VIII. CLAIMS

A copy of the claims involved in the present appeal is attached hereto as Appendix A.

IX. EVIDENCE-Relied Upon by Appellants

Adhesives Age, October 1996, pages 38-44, in Response B. See also the following U.S. patents. Schaetzle, U.S. Patent 5,976,291 at column 1, lines 21-27 and column 2, lines 58-67; Gutowski et al., U.S. Patent 5,879,757 at column 1, lines 5-65 and column 3, line 66 to column 4; Matsuda et al., U.S. Patent 5,576,558 at column 1, lines 14-42 and column 4, lines 21-23; Blow et al., U.S. Patent 5,307,428 at column 1, line 20 to column 2, line 40 and Simpson et al., U.S. Patent 5,132,172 at column 1, line 18 to column 2, line 39; Birnbrich et al., U.S. Patent 6,107,406 at column 1, line 6 to column 2, line 43; Bilkadi, U.S. Patent 5,639,546 at column 1, lines 20-62 and column 3, lines 47-53; and Kunz, U.S. Patent 5,387,449 at column 5, line 45 to column 6, line 30. The § 1.132 Declaration of Toni Ristoski submitted with the response filed October 7, 2005 is relied upon by the Appellants in the arguments presented herein. No evidence entered by or relied upon by the Examiner is being submitted.

IX. RELATED PROCEEDINGS

No related proceedings are referenced in II. above, or copies of decisions in related proceedings are not provided, hence no Appendix is included.

Dated:

Respectfully submitted,

By _____
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APPENDIX A

Claims Involved in the Appeal of Application Serial No. 10/673,615

1. A fuel tank comprising two or more sections having an untreated low energy surface bonded together with an adhesive which bonds to low energy surface materials, wherein the cured adhesive has a lap shear strength of about 400 psi or greater, wherein the adhesive does not require surface pretreatment of the low energy surface materials.

2. The fuel tank of Claim 1 which is made of a thermoplastic or thermosetting polymer.

3. The fuel tank of Claim 1 wherein the fuel tank is a mono layer low energy surface material or a multilayer structure comprising a core layer of a fuel barrier polymer and outer layers of a low energy surface material.

4. The fuel tank of Claim 3 wherein the low energy surface material is high density polyethylene and the fuel barrier polymer is selected from the group consisting of polyamides, fluoroelastomers, polyacetal homopolymers and copolymers, sulfonated and fluorinated high density polyethylene, ethylene vinyl alcohol polymers and copolymers, hydroxy-functionalized polyethers and polyesters, and branched polyesters.

5. The fuel tank of Claim 1 wherein the adhesive supports a load of 1334 Newtons.

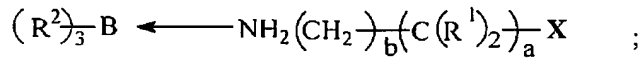
6. The fuel tank of Claim 1 wherein the adhesive has a fuel vapor permeation rate of not more than 46 g-mm/m^2/day.

7. The fuel tank of Claim 1 wherein the adhesive comprises an amine/organoborane complex.

8. The fuel tank of Claim 7 wherein the organoborane is a trialkyl borane or alkyl cycloalkyl borane and the amine is selected from the group consisting of (1) amines having an amidine structural component; (2) aliphatic heterocycles having at least one nitrogen in the heterocyclic ring wherein the heterocyclic compound may also contain one or more nitrogen atoms, oxygen atoms, sulfur atoms, or double bonds in the heterocycle; (3) primary amines which in addition have one or more hydrogen bond accepting groups wherein there are at least

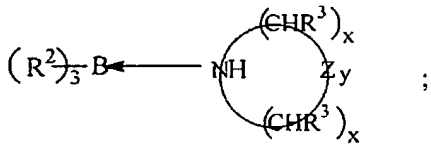
two carbon atoms, preferably at least three carbon atoms, between the primary amine and the hydrogen bond accepting group, such that due to inter- or intramolecular interactions within the complex the strength of the B-N bond is increased; and (4) conjugated imines.

9. The fuel tank of Claim 7 wherein the complex of the organoborane and the primary amine corresponds to the formula



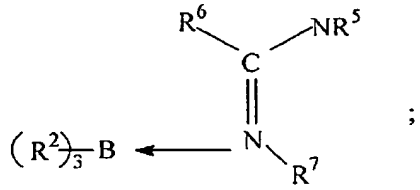
;

the organoborane heterocyclic amine complex corresponds to the formula



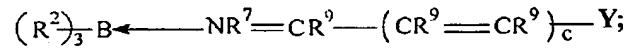
;

the organoborane amidine complex corresponds to the formula



;

and the organoborane conjugated imine complex corresponds to the formula



wherein B is boron; R^1 is separately in each occurrence hydrogen, a C_{1-10} alkyl or C_{3-10} cycloalkyl; R^2 is separately in each occurrence a C_{1-10} alkyl, C_{3-10} cycloalkyl or two or more of R^2 may combine to form a cycloaliphatic ring structure; R^3 is separately in each occurrence hydrogen, a C_{1-10} alkyl or C_{3-10} cycloalkyl; R^4 is separately in each occurrence hydrogen, C_{1-10} alkyl, C_{3-10} cycloalkyl, C_{6-10} aryl or alkaryl; R^5, R^6, and R^7 are separately in each occurrence

hydrogen, C_{1-10} alkyl, C_{3-10} cycloalkyl, or two or more of R^5, R^6 and R^7 in any combination can combine to form a ring structure which can be a single ring or a multiple ring structure and the ring structure can include one or more of nitrogen, oxygen or unsaturation in the ring structure; R^9 is independently in each occurrence hydrogen, C_{1-10} alkyl or C_{3-10} cycloalkyl, Y, $-(C(R^9)_2-(CR^9=CR^9)_c-Y$ or two or more of R^9 can combine to form a ring structure, or one or more of R^9 can form a ring structure with Y provided the ring structure is conjugated with respect to the double bond of the imine nitrogen; X is a hydrogen-bond accepting group with the proviso that where the hydrogen bond accepting group is an amine it must be secondary or tertiary; Y is independently in each occurrence hydrogen, $N(R^4)_2$, OR^4, $C(O)OR^4$, a halogen or an alkylene group which forms a cyclic ring with R^7 or R^9; Z is separately in each occurrence oxygen or $-NR^4$; a is separately in each occurrence an integer of from 1 to 10; b is separately in each occurrence 0 or 1, with the proviso that the sum of a and b should be from 2 to 10; c is separately in each occurrence an integer of from 1 to 10; x is separately in each occurrence an integer of 1 to 10, with the proviso that the total of all occurrences of x is from 2 to 10; and y is separately in each occurrence 0 or 1.

10. The fuel tank of Claim 7 wherein the organoborane/amine complex comprises an aliphatic heterocylic amine which is a five or six membered heterocylic compound.

11. The fuel tank of Claim 7 wherein the organoborane compound of the complex has three ligands selected from C_{1-10} alkyl groups or phenyl groups, and the amine compound is selected from 1,6 diaminohexane, diethylamine, dibutylamine, diethylenetriamine, dipropylenediamine, 1,3 propylene diamine, and 1,2 propylene diamine.

12. The fuel tank of Claim 7 wherein the organoborane compound of the complex has three ligands attached to the borane atom and which are selected from C_{1-10} alkyl groups and phenyl and the amine compound is an alkanol amine or a diamine wherein the first amine group is a primary or secondary amine and the second amine is a primary amine.

13. The fuel tank of Claim 7 wherein the amine compound of the complex is a polyoxyalkylene polyamine or a polyamine which is the reaction product of a diprimary amine and a compound having at least two groups which react with a primary amine.

14. The fuel tank of Claim 1 wherein the two or more parts are in the form of clam shells.

15. The fuel tank of Claim 14 wherein the clam shells are made of thermoplastic material and formed by extrusion blow molding, injection molding, thermoforming or compression molding.

21. A fuel tank assembly comprising a fuel tank and fuel tank component(s) selected from the group consisting of a fill spud, vent valve, access cover, fuel line, fuel pump, fuel cut-off valve, fuel level gauge, clip, cam lock, fuel sender, roll-over valve, and heat shield, and joined to the fuel tank by means of an adhesive wherein the fuel tank, fuel tank components or both have untreated low energy surface and the adhesive bonds untreated low energy surfaces.

23. The fuel tank assembly of Claim 21 wherein the fuel tank and fuel tank components are made of thermoplastic or thermosetting polymers or steel.

24. The fuel tank assembly of Claim 23 wherein the steel is stainless steel, pre-coated low-carbon steel, or post-coated low-carbon steel, and the thermoplastic or thermosetting polymer is polyoxymethylene, nylon, polyethylene, polyethyleneterephthalate, polytetrafluoroethylene, polyvinylidene fluoride, polyvinylidene chloride, ethylene vinyl alcohol or polypropylene.

25. The fuel tank assembly of Claim 23 wherein the fuel tank is co-extrusion blow-molded and the fuel tank components are joined to the external or internal surface of the fuel tank.

26. The fuel tank assembly of Claim 21 further comprising a primary seal applied at the joint between the fuel tank and the fuel tank component(s) and a redundant seal applied around the primary seal.

27. The fuel tank assembly of Claim 21 wherein the fuel tank and fuel tank components are coated with a vapor phase plasma coating.

28. The fuel tank assembly of Claim 27 wherein the plasma coating is applied on the internal or external surface of the fuel tank.

29. A fuel tank assembly comprising a plastic fuel tank having a wall with an outer surface and an inner surface, a single or multi-walled thermoplastic or metal component having a first open end and a second open end, the first open end extending outwardly through an opening in the tank wall, and the second open end extending inwardly into the tank until it is

in contact with the periphery of the tank wall opening and bonded thereto by an adhesive which bonds to low energy surface materials, has a lap shear strength of about 400 psi or greater and which does not require surface pretreatment of the low energy surface materials.

30. A fuel tank assembly comprising (1) a plastic fuel tank having a wall with an outwardly extending cylindrical opening and comprising a multilayer structure having inner and outer layers of untreated low energy surface materials and a fuel barrier layer therebetween and (2) plastic component(s) attached or joined to the fuel tank wall along the periphery of the fuel tank wall opening by means of an adhesive having adequate structural strength, fuel resistance, sealing, and vapor emission properties which is capable of bonding to a untreated low energy surface materials, the plastic component comprising a multilayer structure having thermoplastic inner and outer layers and a fuel barrier layer therebetween, the adhesive contacting the barrier layers of the plastic component and the plastic fuel tank and bridging the gap between the barrier layers of the fuel tank and the plastic components to provide a continuous barrier to fuel vapor emission from the joint between the fuel tank and the plastic components.

39. A fuel tank comprising two or more pieces or sections and an adhesive layer interposed between two adjacent pieces or sections, the adhesive having a lap shear strength of about 400 psi and bonds to low energy surface materials without surface pretreatment of the low energy surface materials.